

I claim:

1. A discontinuous lignocellulose fiber reinforcing filler for thermoplastic composite compositions, the filler comprising at least about 20 percent by weight of discontinuous lignocellulose fibers having a length of at least about 15 millimeters and a diameter of less than 0.5 millimeters.
2. The discontinuous lignocellulose fiber filler as recited in claim 1, wherein the fiber filler is derived from a softwood tree species.
3. The discontinuous lignocellulose fiber filler as recited in claim 1, wherein the fiber filler is derived from a hardwood tree species.
4. The discontinuous lignocellulose fiber filler as recited in claim 1, wherein the fiber is derived from a virgin wood source.
5. The discontinuous lignocellulose fiber filler as recited in claim 1, wherein the dry weight composition of the discontinuous lignocellulose fiber is approximately 27 percent lignin, 23 percent hemicellulose and 45 percent cellulose.
6. The discontinuous lignocellulose fiber filler as recited in claim 1, wherein the diameter of the at least about 20 percent by weight of discontinuous lignocellulose fibers having a length of at least about 15 millimeters is at least about 0.1 millimeters.
7. The discontinuous lignocellulose fiber filler as recited in claim 1, wherein the diameter of the at least about 20 percent by weight of discontinuous lignocellulose fibers having a length of at least about 15 millimeters is between about 0.1 millimeters and about 0.5 millimeters.

8. The discontinuous lignocellulose fiber filler as recited in claim 1, wherein the moisture content of the fiber filler is sufficiently low that blisters do not form in a molded composite including the fiber filler.
9. The discontinuous lignocellulose fiber filler as recited in claim 1, wherein the moisture content of the fiber filler is less than about 5 percent by weight of the fiber filler.
10. The discontinuous lignocellulose fiber filler as recited in claim 1, wherein the particle size distribution of the fiber as percent by total weight of the fiber filler withheld on ASTM screens is about 20 to about 50 percent withheld on an eight mesh screen, about 20 to about 40 percent withheld on a sixteen mesh screen, about 20 to about 30 percent withheld on a fifty mesh screen, and about 10 percent finer than a fifty mesh screen.
11. A process for producing discontinuous lignocellulose fiber, the process comprising the steps of:
  - conditioning wood chips under about 80 to about 100 psi of steam pressure for a period of about one to about four minutes, and
  - mechanically separating the chips into individual discontinuous fibers,whereby a significant percentage by weight of the discontinuous lignocellulose fiber has a length which exceeds about 15 millimeters and a diameter of less than about 0.5 millimeters.
12. The process for producing discontinuous lignocellulose fiber as recited in claim 11, wherein the mechanical separation step comprises passing the wood chips between a rotating disc and a static disc, the discs separated by a gap of about 0.003 to about 0.01 inches, and rotating the disc at about 1200 rpm.

13. A moldable thermoplastic composite composition, comprising:

about 20 to about 50 percent by weight of a discontinuous lignocellulose fiber  
filler, the discontinuous lignocellulose fiber filler comprising at least about 20  
percent by weight of discontinuous lignocellulose fibers having a length of at least  
about 15 millimeters and a diameter of less than about 0.50 millimeters, and

about 50 to about 80 percent by weight thermoplastic.

14. The moldable thermoplastic composite composition as recited in claim 13, wherein the

thermoplastic is selected from polyethylenes, polypropylenes, polyanimides, polyvinyl chloride, ABS, polystyrene, polyester and mixtures thereof.

15. The moldable thermoplastic composite composition as recited in claim 13, wherein the  
thermoplastic is derived from post consumer or post industrial waste sources.

16. The moldable thermoplastic composite composition as recited in claim 13, further  
comprising about up to about 10 percent of a coupling agent.

17. The moldable thermoplastic composite composition as recited in claim 16, wherein the  
coupling agent is up to about 5 percent maleic anhydride grafted polypropylene, and the  
thermoplastic is about 45 to about 75 percent polypropylene.

18. The moldable thermoplastic composite composition as recited in claim 16, wherein the  
coupling agent is up to about 5 percent maleic anhydride grafted polyethylene, and the  
thermoplastic is about 45 to about 75 percent polyethylene.

19. The moldable thermoplastic composite composition as recited in claim 16, wherein the  
coupling agent is up to about 10 percent ethylene methacrylic or acrylic acid, and the

thermoplastic is about 40 to about 70 percent of polyethylenes, polypropylenes, polyanimides, polyvinyl chloride, ABS, polystyrene, polyester or mixtures thereof.

20. A process for preparing a moldable thermoplastic composite composition, the process comprising the steps of:

providing about 20 to about 50 percent by weight of the composite composition of a discontinuous lignocellulose fiber filler, the discontinuous lignocellulose fiber filler comprising at least about 20 percent by weight of discontinuous lignocellulose fibers having a length of at least about 1.5 millimeters and a diameter of less than 0.50 millimeters,

providing about 50 to about 80 percent by weight of the composite composition of a thermoplastic,

blending the discontinuous lignocellulose fiber filler and the thermoplastic,

extruding the blended discontinuous lignocellulose fiber filler and thermoplastic through a single screw extruder at an extruder operating temperature of less than about 450°F.

21. The process for preparing the moldable thermoplastic composite composition as recited in claim 20, further comprising the steps of forming the extruded composite composition into a finished product, and cooling the finished product to ambient temperature.
22. The process for preparing the moldable thermoplastic composite composition as recited in claim 20, further comprising the step of providing up to about 10 percent by weight of the composite composition of a coupling agent.

- SEARCHED
- INDEXED
- COPIED
- SERIALIZED
- FILED
23. The process for preparing the moldable thermoplastic composite composition as recited in claim 22, wherein the step of providing the coupling agent comprises providing up to about 5 percent by weight of the composite composition of maleic anhydride grafted polypropylene, and wherein the step of providing the thermoplastic comprises providing about 45 to about 75 percent by weight of the composite composition of polypropylene.
24. The process for preparing the moldable thermoplastic composite composition as recited in claim 22, wherein the step of providing the coupling agent comprises providing up to about 5 percent by weight of the composite composition of maleic anhydride grafted polyethylene, and wherein the step of providing the thermoplastic comprises providing about 45 to about 75 percent by weight of the composite composition of polyethylene.
25. The process for preparing the moldable thermoplastic composite composition as recited in claim 22, wherein the step of providing the coupling agent comprises providing up to about 10 percent by weight of the composite composition of ethylene methacrylic or acrylic acid, and wherein the step of providing the thermoplastic comprises providing about 40 to about 70 percent by weight of the composite composition of polyethylenes, polypropylenes, polyanimides, polyvinyl chloride, ABS, polystyrene, polyester or mixtures thereof.